Sovereign Debt Restructurings, Debt Overhang, and Aging

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**The views expressed herein are those of the author and should not be attributed to the IMF, its Executive Board, or its management.**
Overview of the Paper

• Empirical, theoretical and quantitative analysis of sovereign debt overhang and restructurings.

• Two main contributions to the literature on sovereign debt:
  
  o New dataset on government spending portfolio and new stylized facts on restructurings and government spending portfolio.
  
  o New theoretical explanations on debt overhang due to delay in debt restructurings.
New Data on Private and Public Sector Spending Portfolio and Sovereign Debt Restructurings

- **Existing dataset** on sovereign debt restructurings
  - Debt restructurings with private external creditors over 1978–2010 (179 episodes)
  - Duration of restructurings (monthly frequency): Asonuma and Trebesch (2016)

- **New dataset** on private and public sector spending portfolio
  - Private sector consumption & investment: IMF WEO/IFS Data
  - Public sector consumption & investment: IMF FAD & Investment and Capital Stock Data
• **Stylized fact 1:** Public sector investment falls sharply and consumption decreases gradually prior to the start of restructurings.

• **Stylized fact 2:** Private sector investment falls sharply after the start of restructurings, while private sector consumption is steady.

• **Stylized fact 3:** GDP starts declining prior to the start of restructurings and continues its declining trend (Asonuma and Trebesch 2016).
New Stylized Facts on Private and Public Sector Spending Portfolio during Debt Restructurings

- **Stylized fact 1:** Public sector investment falls sharply and consumption decreases gradually prior to the start of restructurings.

(A). Gov. Investment/GDP

(B). Gov. Consumption/GDP
Stylized fact 2: Private sector investment falls sharply after the start of restructurings, while private sector consumption is steady (less affected).

(A). Private Investment/GDP

(B) Private Consumption/GDP
New Stylized Facts on Private and Public Sector Spending Portfolio during Debt Restructurings

- **Stylized fact 3:** GDP starts declining prior to the start of restructurings and continues its declining trend.
  
  A. Real GDP per capita (level)
**Stylized fact 1:** Public sector investment falls sharply and consumption decreases gradually prior to the start of restructurings.

**Stylized fact 2:** Private sector investment falls sharply after the start of restructurings, while private sector consumption is steady.

**Stylized fact 3:** GDP starts declining prior to the start of restructurings and continues its declining trend (Asonuma and Trebesch 2016).
Main Questions / Focus of the Paper

• Main questions
  o Why government investment falls sharply prior to the start of restructurings and follows its declining trend? (different from gov. consumption and priv. investment)
  o Why output continues its downward trend during debt restructurings (debt overhang)?

• Main focus
  o We analyze the mechanism of debt overhang due to lengthy debt restructurings.
  o Our theoretical innovation - To embed explicitly government spending portfolio choice in a standard sovereign debt restructuring model (multi-round).
Implications of the Paper

• New dataset and stylized facts on debt restructurings and government spending portfolio
  o Government investment falls sharply and consumption decreases gradually prior to the start of restructurings.
  o Private sector investment falls sharply after the start of restructurings, while private sector consumption is steady.

• New theoretical explanations on debt overhang due to lengthy restructurings
  o Restructurings are protracted when public capital is low.
    (1) limited capacity of repayment
    (2) high marginal productivity of gov. investment

• Implications for Aging in AMs
  o AM sovereigns (high share of aged population) experience a more severe decline in government investment and output decline.
In debt restructuring, the sovereign has low public capital.

- The sovereign suffers longer duration of restructurings (financial autarky)
  
  (1) limited capacity of repayment
  (2) high marginal productivity of capital
  
  => More gov. investment / Less debt repayment
     / less gov. consumption.

- The sovereign suffers lower GDP growth due to the loss in productivity and financial autarky (debt overhang).
  
  (1) non-settlement / no crisis solution
  (2) no borrowing from abroad to accumulate capital.

Intuition : Mechanism of Debt Overhang
• Sovereign debt overhang

• Sovereign defaults and renegotiation in a classical set-up of Eaton and Gersovitz (1981)
  o Benjamin and Wright (2009), Kovrijnykh and Szentes (2007), Yue (2010), Bi (2008), Pitchford and Wright (2012), Hatchondo et al. (2014), Bai and Zhang (2010), Asonuma and Trebesch (2016), D’Erasmo (2010), Arellano and Bai (2014), and Asonuma and Joo (2016).

• Empirical analysis on sovereign debt restructurings
Sovereign debt defaults and renegotiation in a dynamic small-open economy model:

- The sovereign’s choice of default and restructuring is endogenous.
- The sovereign’s choice of (gov.) consumption and investment is endogenous.
- Current output is determined endogenously with government capital, labor and productivity (shocks).
- The negotiation delay, i.e., sovereign’s decision to settle or postpone the negotiation is endogenous.
- Agreed recovery rates in restructurings are endogenous.
Sovereigns are more likely to settle negotiations with creditors (settlement), while less likely to delay (delay)

A. Baseline (mean public capital)
When public capital is low, sovereigns are more likely to delay the negotiation.

(B) Low public capital  
(C) High public capital

Quantitative Analysis – Steady State Dist.
When debt is high and productivity is low, sovereigns spend less on (gov.) consumption.

A. Baseline (mean public capital)
Quantitative Analysis – Steady State Dist.

- When public capital is low, sovereigns are spend less on (gov.) consumption.

(B) Low public capital

(C) High public capital
When debt is high and productivity is high, sovereigns spend less on (gov.) investment.

A. Baseline (mean public capital)
Quantitative Analysis – Steady State Dist.

- When public capital is low, sovereigns are spend a little more on (gov.) investment.

(B) Low public capital  
(C) High public capital
Public sector investment falls more sharply and consumption stay more steadily prior to the start of restructurings.
GDP starts more severe declining trend prior to the start of restructurings and continues its declining trend.

(A) Real GDP per capita (level)

All external debt restructurings
Conclusion

• **New dataset and stylized facts on debt restructurings and government spending portfolio**
  - Government investment falls sharply and consumption decreases gradually prior to the start of restructurings.
  - Private sector investment falls sharply after the start of restructurings, while private sector consumption is steady.

• **New theoretical explanations on debt overhang due to lengthy restructurings**
  - Restructurings are protracted when public capital is low.
    1. limited capacity of repayment
    2. high marginal productivity of gov. investment

• **Implications for Aging in AMs**
  - AM sovereigns (high share of aged population) experience more severe decline in government investment and output decline.
Appendix - Model: Timing of the Model

Productivity realizes $a_t$

**Repay its debt**
- Access to the market
  
  $h_{t+1} = 0$

Productivity realizes $a_{t+1}$

- Household:
  - $c_t$
  - $l_t$
- Firm:
  - $l_t^*$
- Government:
  - $b_{t+1}$
  - $k_{t+1}$
- Creditors:
  - $b_{t+1}^*$
- Bond Prices:
  - $q$

**Initial assets/debt $b_t$**

**Public capital $k_t$**

**Default**
- Financial autarky
  
  $h_{t+1} = 1$
- Output costs

- Household:
  - $c_t$
  - $l_t$
- Firm:
  - $l_t^*$
- Government:
  - $k_{t+1}$

**Accept offer**
- Regain access
  
  $h_{t+2} = 0$

**Propose offer**

- Remain autarky

**Reject offer**
- Remain autarky
  
  $h_{t+2} = 1$

**Wait proposing**

$t$ ~ $t+1$